

Patent claims

1. Method for vapor deposition of a substrate with a layer of a spicular x-ray luminophore with at least one alkali metal, in which alkali halogenide phases are
5 simultaneously vaporized with an alkali halogenide, mixed in the vaporization phase and vacuum-deposited on the substrate.
2. Method according to claim 1, characterized in that the vapor deposition is implemented at temperatures between 50°C and 300°C and a pressure between
10 0.001 Pa and 3 Pa.
3. Method according to claim 1 or 2, characterized in that a temperature treatment of the luminophore layer is implemented after the vapor deposition and a cooling.
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4. Method according to claim 3, characterized in that the temperature treatment after cooling preferably ensues at room temperature in the presence of water vapor.
- 20 5. Method according to claim 3 or 4, characterized in that the temperature treatment ensues in the range from 100°C to 300°C.
6. Method according to any of the claims 3 through 5, characterized in that the temperature treatment ensues in a mixture of inert gas and water vapor.
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7. Method according to any of the claims 3 through 5, characterized in that the temperature treatment ensues in humid air.
8. Method according to any of the claims 1 through 7, characterized in that
30 $\text{Cs}_x\text{Eu}_y\text{Br}_{(x+2y)}$ is used as an alkali halogenide phase and CsBr is used as an alkali

halogenide, such that an x-ray storage luminophore of the general formula $\text{Cs}_x\text{Br} : \text{Cs}_x\text{Eu}_y\text{Br}_{(x+2y)}$ forms.

9. Method according to any of the claims 1 through 8, characterized in that a
5 quantity x of the alkali halogenide phase and a quantity $(600g - x)$ of the alkali
halogenide are mutually vaporized.

10. Method according to any of the claims 1 through 9, characterized in that the
10 alkali halogenide phase and the alkali halogenide are mixed and introduced into a
vaporization boat.

11. Method according to any of the claims 1 through 9, characterized in that the
alkali halogenide phase and the alkali halogenide are separately introduced into a
15 plurality of vaporization boats.

12. Spicular x-ray luminophore with at least one alkali metal, produced
according to the method according to any of the claims 1 through 11 according to
the following formula:

$$\left(\left(\text{M}^{+} \text{H}^{-} \right)_a \left(\text{M}^{++} \text{H}^{--} \right)_{(1-a)} \right)_k : \left(\text{M}^{+} {}_x\text{S}^{z+} {}_y\text{H}^{-} {}_x\text{H}^{---} {}_{z+y} \right)_b \left(\text{M}^{++} {}_x\text{S}^{z+} {}_y\text{H}^{--} {}_x\text{H}^{---} {}_{z+y} \right)_c$$

$$20 \quad \left(\text{M}^{+} {}_x\text{S}^{z+} {}_y\text{H}^{--} {}_x\text{H}^{---} {}_{z+y} \right)_d \left(\text{M}^{++} {}_x\text{S}^{z+} {}_y\text{H}^{-} {}_x\text{H}^{---} {}_{z+y} \right)_e$$

whereby M^{+} is at least one metal ion from the group Na, K, Rb and Cs, H^{-} is at
least one halogenide from the group F, Cl, Br and I and S^{z+} is at least one
lanthanide ion from the group La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er,
Tm, Yb or Lu.

13. X-ray luminophore according to claim 12, characterized in that it is an x-
25 ray storage luminophore according to the following formula:

